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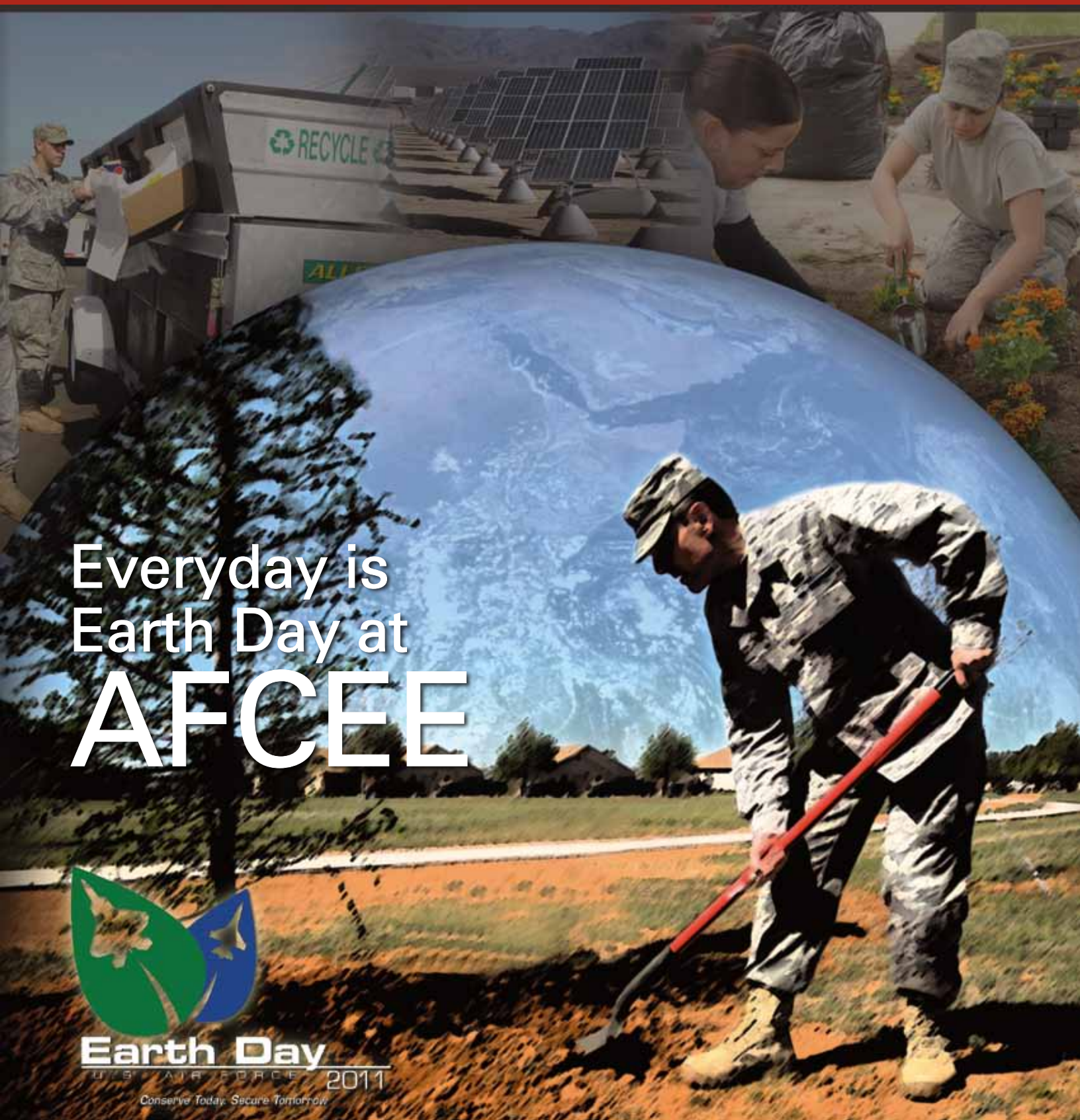

U.S. AIR FORCE

CENTERVIEWS

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On the cover:
The Air Force Center for Engineering and the Environment advocates for the environment in all aspects of its mission, from green construction to resource conservation and environmental restoration.

For AFCEE,
Everyday is Earth Day.

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Top to Bottom:

Photo 1: A worker at a munitions response site at Kirtland Air Force Base, N.M., uses an industrial magnet to remove munitions debris from a mine shaft. (Courtesy photo) See page 18.

Photo 2: The Massachusetts Military Reserve celebrates 15 years of successful Installation Restoration Program management this year. The AFCEE team includes (left to right) Rose Forbes, Jon Davis, Mike Minior and Doug Karson. See page 20.

Photo 3: Phil Chase monitors Sedum plants on the vegetative rooftop of the 21st Space Wing headquarters building at Peterson Air Force Base, Colo. Mr. Chase is the solid waste and hazardous materials program manager for the 21st Civil Engineer Squadron Asset Management Flight. (U.S. Air Force photo/Thea Skinner). See page 6.

Photo 4: Rubble piles at Air Force Plant 42 were excavated and screened for contaminants, and then recycled for use as road base. (Courtesy photo) See page 10.

Our earth...our responsibility

By Terry Edwards

When I arrived at AFCEE in 1991, it was clear the stewardship of the Air Force natural environment rested squarely on the shoulders of the then newly formed team at the Air Force Center for Environmental Excellence.

Before AFCEE was established, the Air Force didn't have a centralized function where commanders could go for help with their installation's environmental programs. AFCEE met this need by developing a staff with the expertise to plan and execute these programs that are critical to the sustainability of our installations, which serve as the Air Force's mission platforms.

I started out as an environmental program manager and then worked several other environmental missions as I took on more responsibility in what were then directorates in the organization. I spent 18 months in environmental compliance, seven years as an environmental project manager and senior environmental engineer, and later served for nearly a year as the chief of the Compliance and Pollution Prevention Service Division in the Environmental Quality Directorate.

My experiences in those programs and the mentorship I received in the early years from AFCEE leaders helped me develop a deep understanding of the Air Force's commitment to environmental protection and pride in the excellent work AFCEE was doing in support of that commitment. I was not alone in feeling passionate about our mission, because I witnessed daily the devotion and dedication of my fellow AFCEE teammates, who always went the extra mile to ensure we were doing the right things to successfully execute the environmental mission. And that is still the case today.

Despite a name change to the Air Force Center for Engineering and the Environment in 2007, the AFCEE team's commitment to environmental excellence remains unchanged. In fact, with the addition of the Environmental Restoration Account program four years ago, I would say our commitment has increased with the growth of our environmental mission responsibilities.

We are proud to be the Air Force's environmental stewards. As we celebrate the 20th anniversary this summer of conducting our environmental mission, we are excited about the promise innovations and efficiencies hold for helping us improve how we restore and protect Mother Earth in the future!

The more than 800 AFCEE people in San Antonio, at our Regional Environmental Offices in Atlanta, Dallas and San Francisco, and at more than a dozen other sites around the globe are now – more than ever – the go-to team for executing Air Force environmental programs. Our sights are clearly focused on achieving Excellent Installations through effective and efficient environmental program management.

It's fitting, therefore, as the nation observes Earth Day April 22, to highlight some of the success stories and programs that showcase how AFCEE continues to be the Air Force and Department of Defense leader in environmental restoration, compliance, pollution prevention and conservation. This issue of CenterViews is dedicated to Earth Day and the conscientious care the Air Force provides for its small piece of our Earth. In these pages, you will read about the worldwide mission AFCEE conducts and how we support the 2011 Air Force Earth Day theme, "Conserve today. Secure tomorrow." ❑

Helping the Air Force better design, construct, manage assets

By Nicholas Lutton
AFCEE Public Affairs

Being able to see what you are going to build before you build it is not a futuristic idea. Since fiscal 2010, the Air Force Center for Engineering and the Environment has required Building Information Modeling to be utilized for the design of all vertical military construction projects.

BIM is a three-dimensional, dynamic modeling approach aimed at increasing productivity in building design and construction. The National BIM Standard defines BIM as the "digital representation of the physical and functional characteristics of a facility. As such, it serves as a shared, collaborative information resource for a facility from inception onward."

> *"With full integration, BIM will increase speed of design, reduce the amount of design errors, reduce construction modifications and greatly enable facility management with more robust facility data."*
>
> Rick Sinkfield

Use of BIM can also assist the Air Force in "green" construction and Leadership in Energy and Environmental Design certification by enabling daylight and energy modeling and analysis, according to Maj. Patrick Suermann, AFCEE Executive Officer and BIM advocate.

AFCEE is not the only agency to use BIM. Several other major owners like the General Services Administration, Army Corps of Engineers, Veterans Affairs and the states of Wisconsin and Texas also require BIM-based approaches.

"BIM can produce greater productivity and higher-quality work from facility planning through decommissioning," said Rick Sinkfield, AFCEE architect and architecture subject matter expert. "With full integration, BIM will increase speed of design, reduce the amount of design errors, reduce construction modifications and greatly enable facility management with more robust facility data."

Mr. Sinkfield also said the building industry is in the midst of a revolution that will change how the building process is handled, and BIM is the catalyst. All the benefits mentioned above will help improve the process, leading toward more accurate and robust designs, he said.

"BIM is applied in the earliest steps of building design, even if it a listing of how many rooms there will be," Mr. Sinkfield said. "From there, the more information that's gathered from the stakeholders and technical folks, the more it becomes a model. Then, the information is the key to everything that follows. When all the information becomes available, users and operators can draw from it to track building performance and manage its operations."

Mr. Sinkfield said asset management integration will yield the largest benefit.

"The best is yet to come. When full asset management integration occurs, we will see the greatest benefit," he said. "Building operations account for over 80 percent of a building's lifecycle cost, so there's where the biggest bang for the buck will happen." ❑

NEW ROOFS PROVIDE

(L to R) The fitness center at Tyndall Air Force Base includes environmentally friendly technologies, such as these solar panels, or photovoltaics, and cool-roof technology, which acts to lower the temperature of the roof. (U.S. Air Force photo/Jonathan Green)

An employee takes a break on the rooftop observation deck of the Air Force Weather Agency headquarters building at Offutt Air Force Base, Neb., which features cool-roof technology. (U.S. Air Force photo/Ryan Hansen)

Air Force officials use more green-roof technologies

By Debbie Aragon
AFCEE Public Affairs

If they're not providing top cover on Air Force bases already, chances are they will be soon. With the Air Force's continued emphasis on sustainability, energy conservation and environmental consciousness, green-roof technologies, and other efficiency measures are high on the priority list for new military construction and ongoing roof repair and replacement programs, said Paula Shaw, the Air Force Sustainability Design and Development Program manager at the Air Force Center for Engineering and the Environment.

The most common technologies used by the Air Force are cool roofs, vegetative roofs and renewable-energy generation. They are designed to create more sustainable infrastructure that reduces energy use, lessens the impacts of storm water runoff, and allows for water conservation. Of current Air Force construction projects, almost 200 of them, at more than 100 locations, incorporate these new, efficient technologies.

Cool-roof technology is the most commonly used roofing innovation in the Air Force. Using a variety of solar-reflective materials to lower the temperature of the roof, cool-roof technology supports the U.S. Green Building Council's Leadership in Energy and Environmental Design criteria.

Cool roofs save energy costs associated with chilling the air inside the buildings. They are installed at various locations around the Air Force, including Offutt AFB, Neb., Nellis AFB, Nev., and recently on a new fitness center at Tyndall AFB, Fla., according to officials.

A vegetative roof, one that is covered with low-growing plantings that require little maintenance, reduces storm water runoff by as much as 80 percent, reduces the roof's temperature to save energy and extends the life of the roof, according to engineers.

"The (Peterson AFB) project was set up to validate the usefulness of green-roof technologies to the Air Force," said Randy Hawke, facilities excellence architect at Peterson AFB. "Along with the roof, a one-year study was conducted to evaluate possible benefits to the Air Force."

The payback, Mr. Hawke said, is probably considerably better than the one-year study reflected. A study over a 3-5 year period would need to be accomplished to fully understand all of the savings, he added.

"In my opinion, the technology is great," he said.

Vegetative roofs are also in place at Andrews AFB, Md., and Ramstein Air Base, Germany, and although there are no other vegetative roofs planned currently at Peterson AFB, there are six active projects that include these types of roofs across the Air Force.

The third technology, renewable energy, uses solar technologies to generate electrical power and heat water. Thirteen current projects include these types of roofs.

Because of their very nature, not all sustainable roof technologies are suited for all areas.

"Not one technology is right for all locations and all building types," Ms. Shaw said. Engineers consider various factors to determine the feasibility of using green-roof technologies. These factors include, but

GREEN TOP COVER

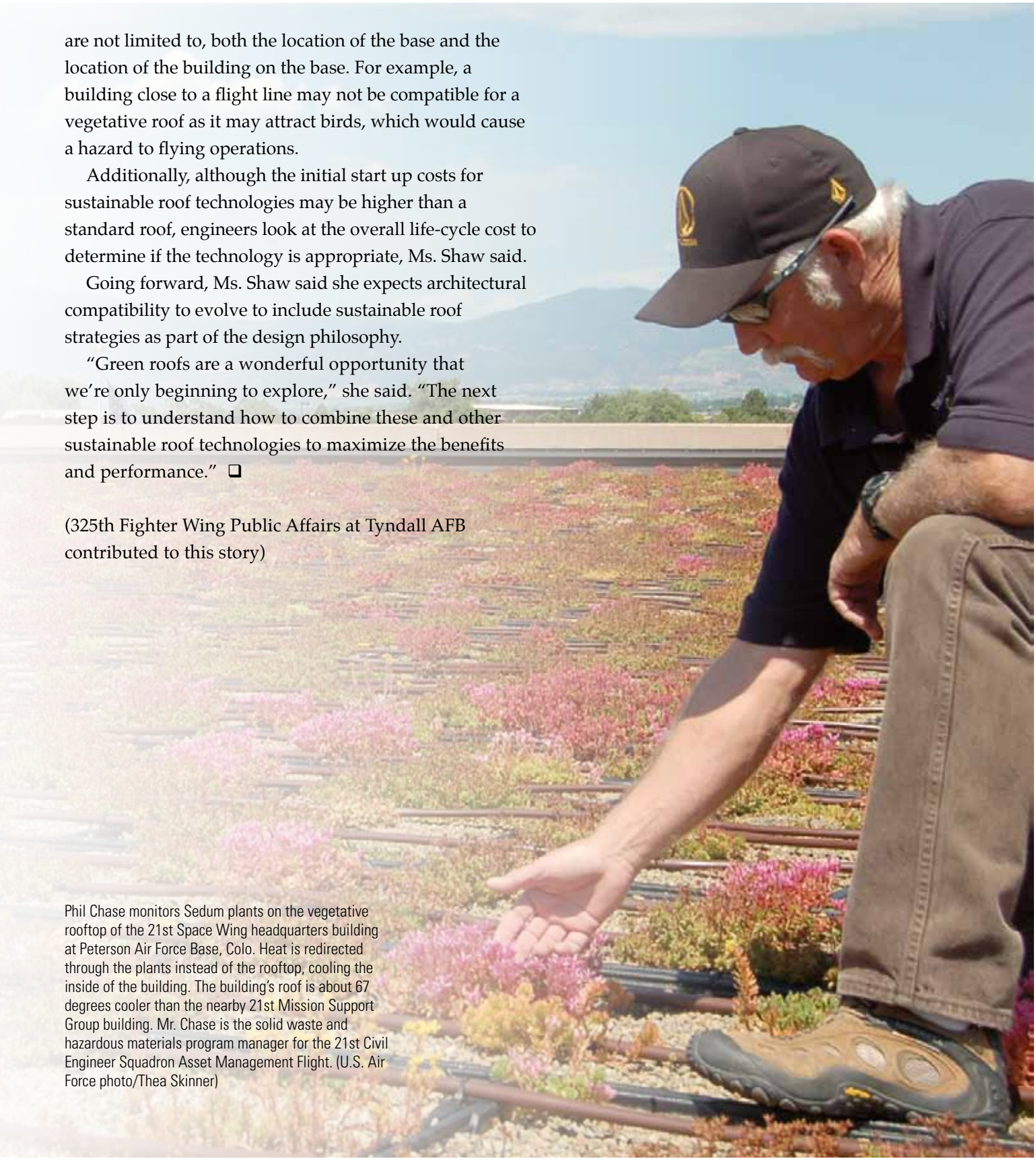
are not limited to, both the location of the base and the location of the building on the base. For example, a building close to a flight line may not be compatible for a vegetative roof as it may attract birds, which would cause a hazard to flying operations.

Additionally, although the initial start up costs for sustainable roof technologies may be higher than a standard roof, engineers look at the overall life-cycle cost to determine if the technology is appropriate, Ms. Shaw said.

Going forward, Ms. Shaw said she expects architectural compatibility to evolve to include sustainable roof strategies as part of the design philosophy.

"Green roofs are a wonderful opportunity that we're only beginning to explore," she said. "The next step is to understand how to combine these and other sustainable roof technologies to maximize the benefits and performance." ❑

(325th Fighter Wing Public Affairs at Tyndall AFB contributed to this story)



Phil Chase monitors Sedum plants on the vegetative rooftop of the 21st Space Wing headquarters building at Peterson Air Force Base, Colo. Heat is redirected through the plants instead of the rooftop, cooling the inside of the building. The building's roof is about 67 degrees cooler than the nearby 21st Mission Support Group building. Mr. Chase is the solid waste and hazardous materials program manager for the 21st Civil Engineer Squadron Asset Management Flight. (U.S. Air Force photo/Thea Skinner)

AFCEE includes GREEN INNOVATIONS at large Joint Base Andrews facility

Workers plant vegetation on the rooftop of the new Base Realignment and Closure/National Capital Region Relocation Administrative Facility at Joint Base Andrews, Md. (U.S. Air Force photo/ Summer Allen)

By Summer Allen
AFCEE Capital Investment Execution Contractor

Engineers at the Air Force Center for Engineering and the Environment managed construction of the Base Realignment and Closure/National Capital Region Relocation Administrative Facility, a recently completed five-story office building totaling nearly 380,000 square feet of space.

The building uses some of the green building industry's latest innovations, including a vegetative roof.

"The vegetative green roof was layered first with concrete, roofing membrane (to keep moisture out), insulation, roof barrier (filters the water to keep it clean of dirt and debris), soil and vegetation on the outermost layer," said Micah Shuler, AFCEE project manager.

A vegetative green roof provides many environmental benefits including reduced storm water runoff, which reduces the stress on urban sewer systems, decreased runoff-related pollution of natural waterways, reduced energy costs, decreased roof top temperatures, which also means less smog, and reduced noise pollution.

Other green features of the building include use of low volatile organic compound-emitting finishes, recycling of construction waste, installation of water efficient landscaping, use of certified wood from managed forests and utilization of construction materials containing 20 percent recycled content.

Incorporation of these green features is part of an effort to achieve a Leadership in Energy and Environmental Design Gold rating, thereby surpassing the contract requirements for a Silver rating. Gold is the second highest rating and Platinum is the highest. The ratings are determined by the U.S. Green Council's LEED Program that assigns points and overall ratings for sustainable features included in a building's construction.

In addition to its "green" elements, the facility features the only appeals court for the Air Force and includes legal offices and courts for the 11th Wing. The building is supported by 1,158 parking spaces, can host 2,350 personnel, and includes 64 meeting rooms, 13 open storage facilities, 64 meeting rooms, eight secure VTC conference rooms and five sensitive compartmented information facilities for reviewing and storing classified documents and information.

"There are fewer parking spaces than the number of actual occupants to encourage carpooling, public transportation, and other alternative means of transportation," said Mr. Shuler. "However, there will

also be spaces available adjacent to the facility when the old headquarters building is demolished and occupants move into the new facility."

The NCRRAF also features a green computer networking system, which uses an advanced networking system different from the normal network made of routers and switches. Experts say this network allows for reduced equipment, energy and installation costs, in addition to less copper cabling needed to split network connections.

"It is called the Gigabit Passive Optical Network, or GPON, and it differs from your average network because it brings optical fibers straight to the user's desktop and routes it to additional workstations instead of using routing equipment and hardware normally needed to create the network," said Mark Damico, AFCEE Title II project manager .

Another interesting feature of the system is it is equipped with secure networking functionality to allow workers to remain connected even if they are off-site.

"We were excited to manage the design and construction of this facility to include many sustainable features, and we hope this will pave the way for future sustainable projects at other installations," Mr. Shuler said. ❑

The Air Force Center for Engineering and the Environment recently completed construction of the Base Realignment and Closure/National Capital Region Relocation Administrative Facility at Joint Base Andrews, Md. The facility incorporates many environmentally friendly components, including a vegetative roof. (U.S. Air Force photo/ Summer Allen)

(From top to bottom)

Photo 1: Rubble such as this, consisting of soil, concrete and asphalt, was successfully recycled into road base for Air Force Plant 42. (Courtesy photo)

Photo 2: A laborer hand picks small surface remnants to assure maximum rubble cleanup. (Courtesy photo)

Photo 3: Rubble piles at Air Force Plant 42 were excavated and screened for contaminants, and then recycled for use as road base. (Courtesy photo)

By Jennifer Schneider
AFCEE Public Affairs

The Air Force is always on the lookout for new ways to reduce, reuse and recycle. Piles of rubble generated on Air Force Plant 42 in Palmdale, Calif., were successfully converted into road base for the installation, effectively avoiding the disposal of 50,000 tons of soil, concrete and asphalt to offsite landfills and saving the Air Force over $2 million in disposal costs.

Plant 42 is a federally owned military aerospace facility under the control of Air Force Materiel Command, and is used by the Air Force and its contractors as a center for aircraft manufacturing and flight testing. One site at the facility had been used historically for surface disposal of construction rubble and waste generated during the demolition of an old runway in the late 1960s.

To ensure suitability of the rubble for re-use, the Air Force Center for Engineering and the Environment and remediation contractor CH2M Hill, Inc., worked with California state regulatory agencies to develop a comprehensive sampling plan. Sampling protocols were developed to customize individual risk screenings for each of the eight rubble piles identified onsite.

"The results of the Site 27 rubble pile investigation were used to demonstrate to the California Department of Toxic Substances Control, Regional Water Quality Control Board (Lahonton Region) and California Integrated Waste Management Board that rubble pile

AIR FORCE PLANT 42 CONVERTS RUBBLE INTO ROADS

Workers excavated rubble at Air Force Plant 42 from up to 16-feet deep. (Courtesy photo)

Concrete and asphalt debris is crushed into usable base aggregates for a new road at Air Force Plant 42. (Courtesy photo)

materials were suitable for onsite recycling," said James Laws, CH2M Hill project manager.

Care was taken to screen the piles for hazardous waste, such as paint chips, before reusing.

There were many benefits reaped from using the innovative approach, said George Warner, remedial project manager for Air Force Plant 42. In addition to waste diversion and cost savings, the base also no longer needed a Federal Aviation Administration waiver, which had been in place due to the proximity of the waste piles to an active runway.

Use of the recycled material resulted in a higher quality road, and generated $160,000 in cost savings by eliminating the need to purchase road base, said Ed McCown, Air Force Materiel Command project manager at Air Force Plant 42.

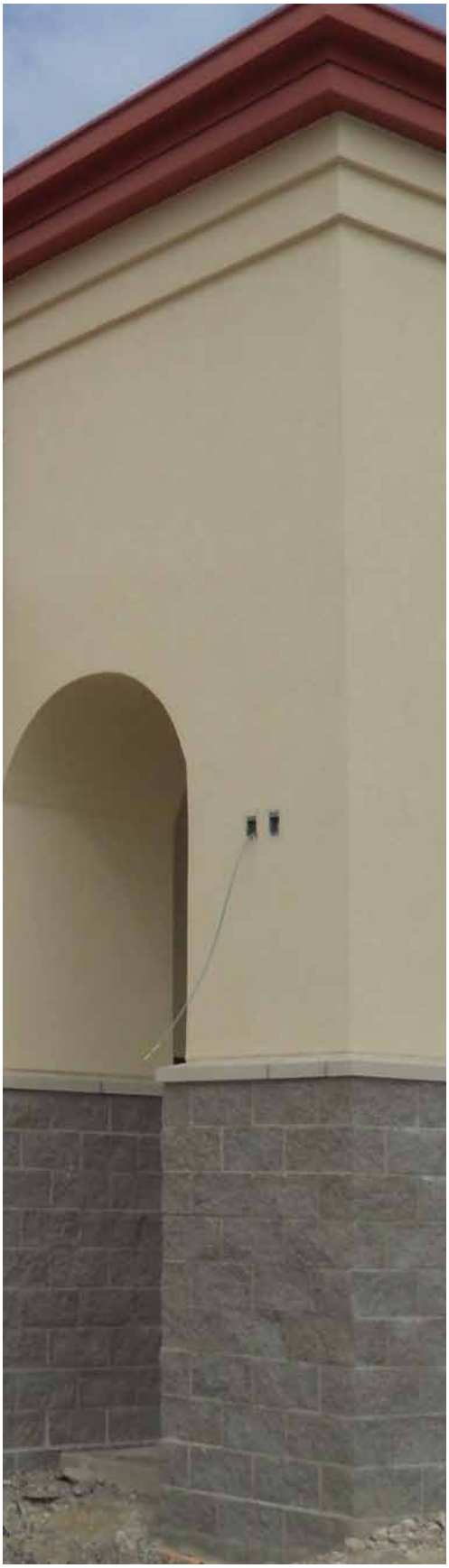
"Additional aggregate base increased the roadway pavement structural section of the perimeter road, giving longer service life of the road under heavy fire truck traffic," Mr. McCown said. "The additional structural fill increased the roadway elevation, which provided better drainage and driver visibility and safety."

The success of projects such as this one emphasize how going "green" can be both environmentally and financially beneficial.

"It's great that we were able to recycle waste instead of just hauling it off," Mr. Warner said. "It was a win-win-win situation." ❑

Work is underway to finalize construction of the Cyberspace Operations Center at Lackland AFB, Texas. The 38,000 square foot facility will be home to the 68th Network Warfare Squadron and the 710th Information Operations Flight, currently located at Brooks City-Base, Texas. (U.S. Air Force Photos/ Summer Allen)

AFCEE director tours sustainable



By Summer Allen
AFCEE Capital Investment Execution Contractor

Since taking office in late October, Terry Edwards, director for the Air Force Center for Engineering and the Environment, paid an inaugural site visit to two major construction projects near completion at Lackland Air Force Base, Texas: the Inter American Air Forces Academy Training Complex and the Cyberspace Operations Center.

In both projects, AFCEE engineers incorporated green features in the buildings' construction, contributing to Air Force sustainability best practices.

After the devastating effects of Hurricane Andrew in 1992, the IAAFA training complex moved from Homestead AFB, Fla., to the former Kelly Air Force Base in San Antonio, Texas, in 1993. Soon after, Base Realignment and Closure legislation closed Kelly and caused IAAFA to move its operations to Lackland.

Engineers and contractors for AFCEE are constructing a 74,600-square-foot training complex for the academy. When completed, it will be a state-of-the art aircraft maintenance and training facility.

"AFCEE's delivery of the high complexity IAAFA BRAC MILCON project is an important milestone in our history as a full-service global MILCON execution agent for the Air Force," said Ben Kindt, AFCEE branch chief who is overseeing the project. "The goal of this site visit was for our director to get a status on the project, view the construction progress to date, and be clear on our plan to complete final delivery of a high-quality facility."

The new facility will consolidate seven existing training facilities, equipment and aircraft currently in various locations at Lackland AFB and the former Kelly AFB. In addition, this new complex will have classrooms, hangars to accommodate aircraft and helicopters, paint shop, new training taxiway and training laboratories.

The training area will have environmentally friendly features such as underground cisterns to

construction projects at Lackland AFB

collect rainwater to be reused for irrigation purposes; light sensors for classrooms; and low-flow toilets.

The building was designed and built in accordance with Leadership in Energy and Environmental Design standards, or LEED, which is a goal-oriented approach to designing and building structures based on sustainable features.

The project also contributed to the "20/20 by 2020" Air Force directive. This directive aims to offset the 20 percent reduction in funds available for installation support activities by reducing the physical infrastructure footprint by 20 percent by the year 2020. A few ways to accomplish this is by optimizing space, demolishing excess facilities and incorporating sustainability in everyday tasks.

"One way we contributed to this Air Force directive is by reusing the old training sites," said Micah Shuler, an AFCEE project manager. "Port San Antonio will be leasing out the old space. In addition, we are implementing a construction waste management plan with a goal of recycling 75 percent of all construction debris."

Mr. Edwards also toured the Cyberspace Operations Center, a 38,000 square foot facility, which will be the pioneer command center for all Air Force cyber warfare. The $11 million BRAC facility will be the new home of the 68th Network Warfare Squadron and the 710th Information Operations Flight, currently located at Brooks City-Base, Texas.

"I am excited to see what progress has been made on this benchmark facility and I am very impressed at the level of effort and hard work involved in building this extremely significant facility for the Air Force," Mr. Edwards said.

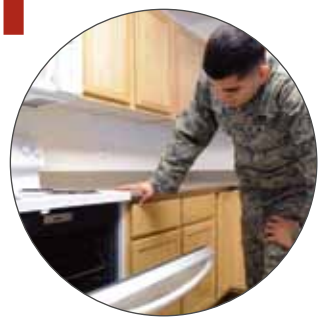
Air Force officials chose Lackland AFB to be the hub of Air Force cyber command operations, citing its proximity to other cyber-related commands such as NSA's Texas Cryptologic Center; Air Force Intelligence, Surveillance, and Reconnaissance Agency; 67th Network Warfare Wing; Joint Information Operations Warfare Command; and Air Force Cryptologic Support Group.

The facility serves as an office building for 400 employees. Some features include a sensitive compartmented information facility, a more modernized operational area, a closed-in patio, and an additional 4,000 square feet for a 100-space parking lot and a new two-lane road.

"We worked extremely hard on this project to ensure the highest possible quality and meet BRAC deadlines," said Dave Gibson, an AFCEE project manager. "We were excited to build this facility for the Air Force, as it is critical to the mission of the intelligence community and overall for our nation's cyber warfare capabilities." ❑

The Inter American Air Forces Academy Training Complex at Lackland AFB, Texas, is nearing completion and will serve as a state-of-the art aircraft maintenance and training facility. The new facility consolidates seven existing training facilities, equipment and aircraft currently at various locations.

Housing privatization project owners focus on SUSTAINABILITY



By Rachel Fish
Housing Privatization Contractor

Private project owners in the Air Force housing privatization program are working with program managers at the Air Force Center for Engineering and the Environment to build energy efficiency and sustainability into every home in their communities.

Project owners are making positive changes by diverting waste from landfills, reducing energy and water use, reusing resources, and maximizing recycling of paper, plastics and metals.

One of the ways project owners are significantly reducing potential landfill waste is through incorporating recycling as part of the planning process for demolition of old homes. Instead of sending cabinets, windows, doors and carpet to the junk heap, they recycle them to non-profit organizations for reuse.

Steps are underway to ensure home designs take advantage of energy saving features such as low-emissivity, glazed windows and natural gas water heaters. Innovative designs also include tubular skylights in laundry rooms and pantries such as the ones installed by Balfour Beatty Communities at Travis Air Force Base, Calif., and Tinker Air Force Base, Okla.

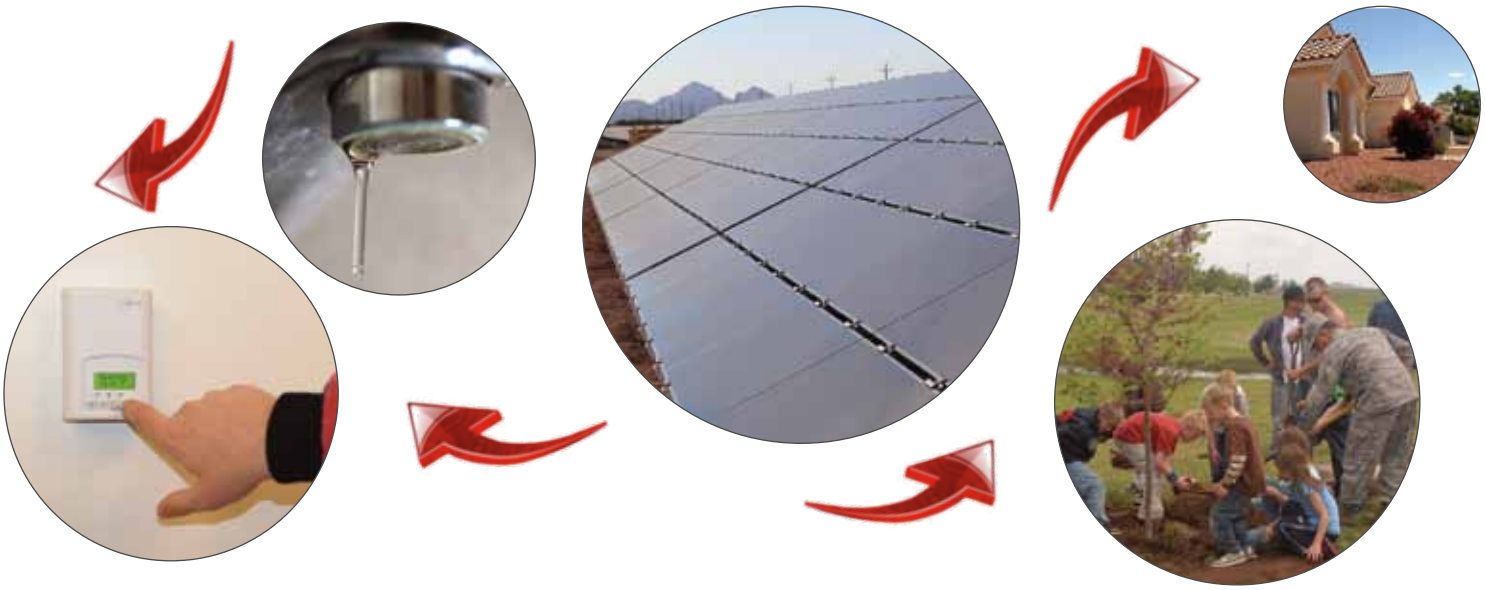
Project owners also incorporate energy-efficient appliances and lighting into many of the homes they build or renovate. These innovations contribute to lower overall energy use, saving utility costs for residents.

BBC recently completed a pilot program at Travis Air Force Base where energy monitoring hubs were installed to monitor energy consumption throughout the day. BBC staff used the results to help residents make decisions that could lower their energy use.

Tierra Vista Communities, built by Actus Lend Lease, recently installed state-of-the-art programmable thermostats in their community. The thermostats can be adjusted by the local utility provider, Colorado Spring's Utilities, during the day when most people are not home, to reduce unnecessary energy consumption. The temperature can't be adjusted more than four degrees, and the home owner can override the change if they choose. While the savings may be slight, the greater benefit is educating consumers about conserving energy.

Solar panels on homes at Davis-Monthan AFB, Ariz

Landscaping consumes more than 40 percent of water usage at an average home. Many project owners use low-flow irrigation heads and xeriscaping to conserve water. Water conservation



measures are also realized through installation of ultra low-flow plumbing fixtures in bathrooms and kitchens.

One of the nation's largest community-wide solar power systems is under construction at Soaring Heights Communities at Davis-Monthan Air Force Base, Ariz.

Upon completion, the community is expected to be the largest solar-powered community in the continental U.S., according to information from project owner, Actus Lend Lease. The solar systems are expected to produce more than 10 million kilowatt hours of electricity annually, sufficient to provide an estimated 75 percent of the residents' energy use, and could eventually offset 100 percent of Soaring Heights Communities' electricity use.

Corporate leadership at Hunt Companies promote Leadership in Energy and Environmental Design certification in their designs and have delivered LEED-certified homes via military construction for the housing at Keesler Air Force Base, Miss. For a home to become LEED-certified, it must be inspected by an independent third party, who rates its performance in such categories as the home's indoor air quality, energy efficiency, use of water-conserving plumbing, durability of its building materials and the sustainability of the building site.

Credit for LEED-certification also considers whether there are open spaces to encourage walking and other outdoor activities that lead to better overall health for residents. These design initiatives will be incorporated in future privatized housing projects built by Hunt.

By focusing on energy savings every day, the Air Force and project owners are also focusing on the future.

"Today we see the growing emphasis on sustainability, which is about more than just environmental or energy programs," said Col. Rodney Croslen, AFCEE Housing Privatization Division Chief. "Sustainability is the responsibility of everyone and impacts the choices we make in how we live, work and plan for the future. The Air Force Housing Privatization Program Management Office and our partners in privatization are committed to continuing efforts to integrate sustainability into everything we do. Innovative planning and implementation will ensure quality housing for today's military families and future generations." ❑

A large underground storage tank is excavated and removed at former McClellan Air Force Base, Calif. (U.S. Air Force Photo)

New contracts concentrate on progress, not process

Following the latest Air Force guidance on performance-based remediation, which focuses on accelerated site completion and reduced overall cost, the Air Force Center for Engineering and the Environment has been laying the groundwork for a more aggressive focus on utilizing performance-based contracts for environmental remediation, and is already beginning to reap the rewards of that effort.

AFCEE awarded its first PBR contract to incorporate the new guidance in fiscal 2011 at the former Griffiss Air Force Base, N.Y., which has already resulted in accelerated site completion of 15 sites, accelerated remediation system optimization for an additional 15 sites, and an eventual life-cycle savings of $6.5 million. Five additional BRAC PBCs and eight active base PBCs are scheduled for award later this year.

"Performance-based contracts allow for fence-to-fence investigation and remediation, and give the contractor flexibility in determining the best methods for treatment," said Col. Jeffrey Knippel, chief of AFCEE's Environmental Restoration division. "We are finding that this often results in the use of innovative solutions and a reduction in overall program management costs, while, at the same time, accelerating environmental remediation and site completion."

PBCs differ from traditional contracting vehicles in that the desired objectives for remediation activities are specified, rather than how the objectives are to

be met. This new focus provides a mechanism for the contractor, who handles both design and construction, to work in conjunction with the Air Force to propose and implement innovative solutions for the Air Force's cleanup requirements.

Creating the foundation for PBC use by developing the required contracting templates and goals, and setting and evaluating criteria for PBC candidates, has been the result of a concerted effort between several AFCEE divisions.

AFCEE's Environmental Restoration division established a Performance-Based Management Cell in October 2010 to establish the framework for evaluating PBC candidates. Project manager Loan Harris assumed the lead of the PBMC in December and will help develop a standardized process for contract award and post-award performance monitoring, in addition to continuing the evaluation of PBC candidates. The evaluation consists of reviewing the base's Environmental Restoration Program and developing an acquisition strategy.

As of January 2011, 23 bases had been evaluated. With all fiscal 2011 candidates evaluated, the focus is now shifting to the fiscal 2012 program and beyond as a master plan is developed.

The management cell will serve as the integration point for all PBRs moving forward, to ensure a consistent approach of this new initiative. Each PBC planned for award will identify an AFCEE Environmental Restoration division and AFCEE Capital Investment Execution division lead for facilitating the action through each phase of the process, both of whom will be responsible for coordinating with the PBMC. The most successful evaluations have been attended by environmental restoration staff from the base, the AFCEE divisions of Environmental Restoration, Capital Investment Execution and Technical Support, the 772nd Enterprise Sourcing Group and several support contractors. Input from all of these groups, particularly the base, is essential in the evaluations and has allowed the team to develop a nine-year acquisition strategy that takes into consideration the needs of the program and the new requirements established by the Assistant Secretary of the Air Force for Installations, Environment and Logistics.

"While PBCs are a valuable tool, they are not appropriate for every site," Colonel Knippel said. "It's important that we conduct these comprehensive evaluations to develop an acquisition strategy for each base independently."

In order to keep the AFCEE staff up to date as the PBC program is being developed and implemented; additional training sessions will be conducted to communicate lessons learned in these initial evaluations.

AFCEE has also been busy educating contractors on the initiative, and hosted a PBC Industry Day in December 2010. The event focused on training contractors on the newly developed templates and providing a forum for industry comments and suggestions. Topics included environmental insurance, small business perspective, reviews of solicitation templates, regulatory issues, site data collection and more. Several recommendations were adopted and incorporated into the contracting templates based on the discussions. ❑

Environmental remediation activities underway for harbor at former Homestead Air Force Base, Fla.

Top to Bottom

Photo 1: Solid propellant is demolished at Kirtland AFB (Courtesy photo).
Photo 2: A surface clearance team walks a grid at Kirtland AFB, N.M., scouring the area for munitions debris, munitions and explosives of concern (Courtesy photo).
Photos 3: A worker uses an industrial magnet (at right) to remove munitions debris from a mine shaft. (Courtesy photo).

KIRTLAND AND AFCEE
restore sites, recycle munitions debris

By Terri Bright
AFCEE Contractor

The Air Force Center for Engineering and the Environment and restoration officials at Kirtland Air Force Base, N.M., have 'gone green' in their munitions cleanup approach, returning hundreds of acres to mission use while at the same time recycling several tons of used munitions.

"Removing munitions and munitions debris is its own reward - we're cleaning up these areas for future generations and knowing that we're working to make an area safer," said Scott Clark, Kirtland military munitions response program manager. "But it's even sweeter when we're able to turn those munitions into recyclable metal. I can say with confidence that the Air Force is implementing the military munitions response program in a smart and thoughtful manner, and it's something we should all be proud of."

The mission of the Air Force military munitions response program is to take action to ensure munitions response areas and munitions response sites located off of active test ranges are safe for reuse, and to protect human health and the environment.

"AFCEE is focused on getting MMRP sites cleaned and closed, and returning the assets back to the war-fighter for beneficial base and mission use," said Michael Litman, AFCEE MMRP program manager. "One of our many goals is to eliminate or reduce the potential explosive and environmental hazards remaining on, or in, used military munitions. Integration of green practices into all MMRP acquisitions is also of primary importance. We are focused on promoting environmental stewardship, sustainable approaches and energy security."

Several projects at Kirtland have already reached completion. Restoration officials and contractors from HydroGeoLogic, Inc., have removed and demolished 6.8 pounds of solid propellant from a proximity fuze testing area, in addition to clearing and recycling 64,000 pounds of munitions debris from several mine shafts and tailings piles including one mine located 35 feet below ground. A surface clearance was also completed over a portion of the field firing range, with 828 acres out of the 2,200-acre response area being successfully cleared by a 20-person field team over a seven-month period. A total of 124,620 pounds of munitions debris were removed and recycled and 742 munitions and explosives of concern were demolished onsite.

AFCEE is also assisting the base with several ongoing MMRP projects, including remedial investigation and soil sampling to support a "No Further Action" decision on areas and sites that were investigated during the installation's Phase II Comprehensive Site Evaluation. Field activities will begin in March 2011.

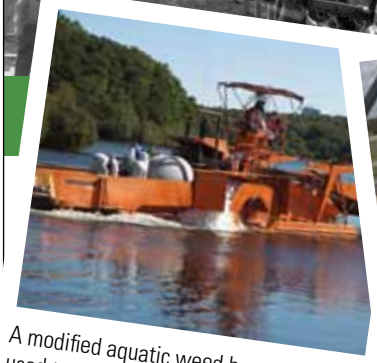
Also underway is the cleanup of two former trap and skeet ranges. A performance-based contracting vehicle is being utilized for Environmental Chemical Corporation to conduct an engineering evaluation and cost analysis, and to conduct the removal action necessary to obtain regulatory closures on the ranges.

AFCEE utilized the overarching PBC approach to reduce the cost and time required to complete environmental restoration projects while effectively managing the government's environmental liability. PBC is part of performance-based management, a holistic and systematic results-based approach to restoration programs and site closure that promotes cost effectiveness.

While future use of the ranges has not yet been determined, residential closure standards will be obtained to allow for unrestricted use.

In addition to the Kirtland projects, AFCEE also executes MMRP projects at several other bases including Hill Air Force Base, Utah; Lackland Air Force Base, Texas; Randolph Air Force Base, Texas; Homestead Air Reserve Base, Fla.; Nellis Air Force Base, Nev.; F.E. Warren Air Force Base, Wyo. AFCEE is also working to develop risk assessment guidance for the Air Force MMRP.

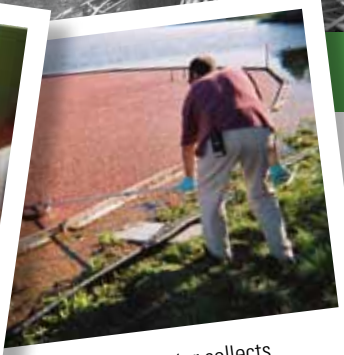
MASSACHUSETTS MILITARY RESERVE



A modified aquatic weed harvester is used to apply a mixture of aluminum sulfate and sodium aluminate to Ashumet Pond in the Towns of Falmouth and Mashpee, to mitigate the negative effects of a phosphate plume.

AFCEE's largest groundwater treatment plant under construction in 2005. It houses 16 tanks each containing 20,000 pounds of granular activated carbon and treats contaminated groundwater from several groundwater plumes at MMR.

Workers inspect a greensand filter in the Fuel Spill 12 groundwater treatment plant at MMR. Greensand filters are used in two plants to remove suspended solids, iron, and manganese before plume water enters granular activated carbon tanks.



An AFCEE contractor collects cranberries for testing. Sampling of river waters just prior to harvest continues today.

AFCEE celebrates 15 years of successful IRP management

By Douglas Karson
AFCEE MMR Public Affairs

"This is the top one for us because of the amount of contamination involved, because of the potential impact on the community, and because of the ecological sensitivities here," said Tad McCall, deputy assistant secretary of the Air Force, speaking on contamination at the Massachusetts Military Reservation in a May 1996 *Cape Cod Times* newspaper article.

This marked the beginning of the Air Force Center for Engineering and the Environment's management role at the MMR on Upper Cape Cod, Mass., when AFCEE assumed responsibility for the Installation Restoration Program at the 20,000-acre military reservation, located on top of a sole-source drinking water aquifer with serious groundwater contamination challenges.

The MMR was officially established in the 1930s with various military activities dating back to 1911. MMR was most active during World War II and during the Cold War era of the 1960s and early 1970s. The use of industrial solvents and fuels was substantial and frequent, with no regulations in place for decades. Solvents and fuels eventually reached the groundwater and created pollution plumes. The first indication of a problem was the closure of a local town well in 1979.

The Air Guard managed the IRP from 1982 to May 1996. The 1980s were characterized by small budgets and staffs grappling to understand the scope of the problem, mistrust and concern in the community, and virtually no opportunities for the public to be informed and involved in the process, said officials. Groundwater pollution off of MMR was in the discovery phase, with testing of off-base private drinking water wells revealing MMR-related contaminants. Citizens were

concerned about their health, property values and the safety of area ponds.

In 1989, the addition of the IRP to the Environmental Protection Agency's National Priorities List brought nationwide attention, as well as more regulatory and public oversight. This was followed by a 1991 community involvement plan which was attached to a Federal Facility Agreement between the Air Guard and EPA. The agreement brought structure, timelines and accountability to the process.

Several citizen advisory teams were created in the early 1990s to help make decisions. A major accomplishment was the creation of a Plume Response Plan in 1994 and a commitment from the Department of Defense to fund it. However, in early 1996, a 60 percent design to address all the plumes simultaneously raised concerns about the ability to implement it without adversely affecting ponds, rivers and the aquifer. This resulted in a setback and the Department of Defense transferred management control from the Air Guard to AFCEE.

AFCEE established four goals when it arrived in 1996, said Jonathan Davis, AFCEE IRP remediation program manager at MMR. They resolved to conduct cleanup of the sole-source aquifer quickly, to establish a community-based program, to develop a collaborative process in conjunction with regulatory agencies, and to regain public trust by obtaining their approval of the process.

"There was a dramatic shift, no question, when AFCEE took over management," said Mary Sanderson, Environmental Protection Agency Region 1 Remediation and Restoration II branch chief, who serves on the Senior Management Board for MMR. "AFCEE didn't look to just contain plumes, they looked at final remedies. They brought in the resources and the technical know-how needed to tackle a project of this capacity and scope, and made efforts to include community dialogue at every step."

Over the last 15 years, much has been accomplished, Mr. Davis said. Threatened town wells were either replaced or have treatment and a local pond has been treated. Hundreds of private wells in the area were tested while AFCEE converted them to municipal water systems. A program was established to identify and determine the safety of remaining private wells in plume areas. AFCEE also designed and constructed 12 plume cleanup systems, and installed more than 130 miles (cumulative depth) of groundwater monitoring wells. Two fire-damaged treatment plants were rebuilt. During AFCEE's management, the Air Force has compensated municipal water providers over $50 million to date for lost resources and to establish municipal connections, and has compensated towns and cranberry farmers for lost crops due to plumes.

AFCEE has retained its focus on community interaction, and has strived to establish better working relationships with residents and media. The team has participated in hundreds of meetings, tours and speaking engagements, and distributed hundreds of fact sheets, news releases and notices. The group also developed an MMR IRP Web site with an online administrative record.

Virginia Valiela, who served as selectman for the town of Falmouth, Mass., for 21 years and is the town's representative on the Senior Management Board, praised AFCEE for its accomplishments.

"They (AFCEE) performed well and continue to do so," Ms. Valiela said. "The public was initially so angry and the problem looked huge. Now it's no longer a political issue – that's a sure sign the problem is being solved."

AFCEE currently operates nine treatment systems on 10 groundwater plumes and is cleaning 13 million gallons of contaminated water every day. Of the original 80 source areas, 77 have been investigated and/or cleaned up and three are being monitored. Sixty-one of the 80 have been delisted by EPA from the MMR Superfund site.

In December 2009, AFCEE began operation of a 1.5 megawatt wind turbine that is estimated to save $500,000 per year. Two additional turbines are under construction. The wind turbines are part of AFCEE's robust optimization and sustainability enhancements to the cleanup program at MMR.

"We applaud the work done, and the investments into the future through sustainable energy sources to manage and optimize the systems," Ms. Sanderson said.

AFCEE's current role centers on expediting aquifer restoration, reducing the operating lifetimes of treatment systems, and executing an extensive Land Use Control program. All final Superfund decisions and cleanup systems are in place. ❑

Environmental Planning Center of Excellence takes root at AFCEE

By Jennifer Schneider
Public Affairs

The Air Force is getting "back to basics" in its National Environmental Policy Act compliance, and now has a place to turn to for guidance and assistance with Environmental Impact Analysis Process requirements.

In November 2010, the Air Force Center for Engineering and the Environment established the Environmental Planning Center of Excellence to support headquarters, major commands and installations with project execution, technical support and consultation for major EIAP efforts.

The Center's standup directly supports an initiative by the Assistant Secretary of the Air Force for Installations, Environment and Logistics to improve the time and cost efficiency of Air Force NEPA processes.

NEPA directs federal agencies to formally assess the environmental impacts of proposed major federal actions including consideration of reasonable alternatives. EIAP is required in the Air Force for any proposed action with a potential environmental impact.

"NEPA requires that we analyze the potential environmental impact of proposed actions and share the results of these analyses with the public," said Dale Clark, EPCE Chief.

According to policy guidance, a proposed action will meet with one of three outcomes. It may qualify for a categorical exclusion, require completion of an environmental assessment when no significant impact is expected, or require completion of an environmental impact statement.

One goal the Air Force has for improving the EIAP process is to reduce the completion time for environmental assessments and environmental impact statements to 6 and 12 months, respectively.

One of the primary tools for reaching this timeframe goal is use of a new process known as "planning requirements for the EIAP." AFCEE is currently developing guidance in support of this process.

"PREIAP focuses on ensuring that the proponent (of the action) and other stakeholders are appropriately engaged in development of the proposed action and other critical information prior to contracting and initiating the EIAP analysis," said Eldon Hix, AFCEE Technical Support Division chief.

Other goals include using performance-based EIAP contracting capabilities, and establishing a timely and accessible milestone tracking system for environmental assessments and impact statements.

The EPCE staff at AFCEE is comprised of NEPA professionals with technical expertise, as well as project managers to assume oversight and execution of NEPA task orders, Mr. Clark said.

The EPCE is still in its early stages, but is prepared to begin supporting major command, installation and program office requirements on a limited basis. For more information, or to request support, contact Mr. Clark at john.clark.7@us.af.mil or 210-395-8379 (DSN 969-8379). ❑

New e-tool expected to aid day-to-day CE operations

By Debbie Aragon
AFCEE Public Affairs

People in the civil engineering community and those with environmental compliance responsibilities across the Air Force will soon have a new tool at their disposal to assist with day-to-day operations, according to officials at the Air Force Center for Engineering and the Environment.

The document management and communications electronic dashboard, eDASH for short, will have environmental management system, or EMS, policies, procedures and other environmental compliance and sustainability information, as well as pages for major commands that can be easily customized to meet the mission at hand.

The electronic dashboard was born from a Civil Engineering Transformation Initiative to establish a single source of information for the Air Force community, said Karen Winnie, AFCEE program manager for EMS.

She said the challenge was determining how to start providing one source for a solution.

To tackle the challenge, AFCEE convened a working group to look at a variety of systems already available and the possibility of developing something in house. The group ultimately selected a Sharepoint-based system very similar to what was already being used in Air Combat Command. The ACC system simply had to be tweaked a little based on research and customer recommendations, she said.

The new communications tool, accessible through a ".mil" account using a common access card, will be divided into four main access areas: Accessible kNowledge for Sustainable Resources (or ANSR), Air Force Policy, Major Commands and Technical Support.

ANSR provides help to users looking for answers to environmental and sustainability questions.

The Air Force Policy area includes such things as civil engineering playbooks containing information on processes and standard operating procedures, a commander's corner, and regulations, policies and references.

Under the Major Command tab, visitors will find customized pages containing information for each major command and their installations.

The Technical Support area offers general information and help with eDASH and ANSR.

Although the ANSR tab is expected to launch by late spring 2011, the entire eDASH system isn't expected to become fully operational until the end of Fiscal 2012.

One very important aspect of the new system will be version control, Ms. Winnie said.

"We want to make sure people will be using the most current version of regulations and policies to make sure we're all on the same sheet of music," she said.

Currently, useful documents reside in several databases and many may not be the most current.

"We want a single document repository. If playbooks, for example, are pulling information from one central location, that would be really important for version control and would allow updating at one location," Ms. Winnie said.

With eDASH, the Web functionality and work collaboration will be a lot more agile than the Air Force portal since each major command is responsible for maintaining their own eDASH pages, she said. AFCEE officials will input and update air staff and AFCEE areas.

Specific system permissions will be assigned at different levels, Ms. Winnie said, to allow updating and uploading of information.

In addition to saving time and maintaining information accuracy with customers accessing one source, the centrally managed system is also expected to be much cheaper to maintain, she said, since many installations and commands currently use different, home-grown products.

"eDASH will be more economical and lead to standardization across the board. A uniform approach for site content and document management will be used. This makes finding information easier when moving from one installation or major command to another," Ms. Winnie said.

eDASH also provides users the opportunity to find examples of documents and policies they can use to develop their own, she added.

More information on eDASH, with detailed information on the unveiling of ANSR, will be provided during the 2011 Environment, Safety and Occupational Health Training Symposium in March through classes and handouts, and thorough various avenues such as AFCEE's Centerviews magazine. ❑

Air Force conservation programs score widespread victories

By Jennifer Schneider
AFCEE Public Affairs

The Air Force is trustee to more than eight million acres of land, water and air assets, and is home to more than 70 threatened and endangered species. Stewardship of these resources, in conjunction with sustainment of critical military mission activities, is a key priority for conservation programs across the Air Force.

Program achievements during fiscal 2010 were widespread, with many accomplishments in support of endangered species.

One of the installations achieving program victories this past year was Eglin Air Force Base, Fla. Measures taken by program officials there have resulted in population increases for both the Okaloosa darter and the red-cockaded woodpecker.

The darter relies on clear water streams, and approximately 95 percent of the total remaining population of the tiny endangered fish resides on the base. The base's efforts to abate erosion at stream crossings and improve crossing structures in critical habitat areas have resulted in a population increase and a determination by the U.S. Fish and Wildlife Service to down-list the species from "endangered" to "threatened" status. The proposed rule is currently under review and will likely be published as a final rule in the Federal Register in the near future, according to base officials.

"It was up to the Air Force to make it or break it for this species," said Bruce Hagedorn, supervisory biologist at Eglin AFB. "This was a monumental victory. It is the first vertebrate species down-listed solely by actions on a military installation."

The victory is the result of hard work and the implementation of innovative measures, such as creating and installing a "sky-lighted" culvert on Eglin's golf course. The well-lit culvert encourages fish to travel through it while still allowing golfers to traverse the course.

Eglin also made strides in protecting another endangered species on base, the red cockaded woodpecker. Old-growth longleaf pine trees on the installation are the preferred habitat for the bird, and Eglin's forest represents the largest contiguous tract of old-growth longleaf pine in the world.

Wildlife biologists at Eglin have mapped, monitored and protected existing woodpecker clusters, and created new nest sites for population expansion by drilling tree cavities. Foresters implement periodic controlled burns and use timber sales to maintain and enhance the landscape of mature longleaf pines with an open understory that is preferred by the woodpeckers.

"Controlled burning is our single most important management tool," Mr. Hagedorn said. "People don't tend to think of forestry and burning and cutting down trees as going together, but it is very important after decades of fire suppression. The forest is dominated by pine trees, but they tend to get encroached on by oaks without controlled burning."

Controlled burns support the mission by reducing the quantity and density of hazardous fuels that may ignite from munitions testing activity on the range, according to Kevin Porteck, natural resources subject matter expert at

the Air Force Center for Engineering and the Environment. When range operations inadvertently start a fire, the resulting fires are of lower intensity and easier to control.

The Barry M. Goldwater Range in southwestern Arizona is also home to endangered species. The range provides an important landscape for military pilot training, while also supporting habitat for the Sonoran pronghorn antelope.

Long-term drought conditions caused the antelope's population to crash to a low of only around 20 animals in 2002. Since that time, management techniques and a collaborative partnership between the Air Force, Marine Corps, U.S. Fish and Wildlife Service, and Arizona Game and Fish Department have led to an increase in the population, with a current estimate of 68 free ranging animals and 52 in a semi-captive breeding facility. At least 25 fawns were born in 2010.

"The biggest effort was construction of a semi-captive breeding pen, which encompasses a square mile," said Daniel Garcia, chief of Environmental Science Management at Luke Air Force Base, Ariz. "The greatest threat is fawn survival. In other parts of the country, females typically deliver twins in early spring and wean in two months, giving the fawns all summer to fatten up for winter. In Arizona, the fawns are weaned when it is blistering hot with no rain for months. The intent with the breeding pens is to get them through their first summer. When we turn them loose, they have graduated from the 'Headstart Program' and are ready to go."

Plans are underway to establish a second population in a separate location, possibly the Kofa National Wildlife Refuge in Arizona, to limit the impacts of potential disease and other factors on the population numbers.

In partnership with the Ventura office of the USFWS, Point Reyes Bird Observatory Conservation Science and the Western Foundation for Vertebrate Zoology, Vandenberg AFB, Calif., was awarded the 2010 Coastal America Award. The Coastal American Partnership Award recognizes teams throughout the United States that demonstrate outstanding efforts to restore and protect the coastal environments.

Vandenberg is responsible for 42 miles of California coastline and manages the protection of 15 federally listed threatened and endangered species. According to Rhys Evans, natural resources lead at Vandenberg, an important biodiversity goal is to promote the population growth of the Purisima Point Least Tern, a seabird on the endangered species list, while maintaining the health of the surrounding ecosystem. To accomplish this objective, Vandenberg established a Least Tern Management Team, which works collaboratively to accomplish management of this endangered species.

The base provides funding for the team, and erected and maintains an electric fence around the colony. PRBO Conservation Science biologists conduct daily population and productivity monitoring, the Western Foundation for Vertebrate Zoology personnel engage in non-lethal removal of predators, and the USFWS coordinates with all of the partners on the adaptive management of this resource.

While increasing population numbers was a goal for some natural infrastructure programs last year, the U.S. Air Force Academy was tackling the opposite problem. Rising populations of mountain pine beetles have ravaged over four million acres of lodgepole and ponderosa pine across Colorado, but proactive measures taken by the Academy team have successfully prevented the school's trees from suffering the same fate.

"We took an aggressive stance and are very optimistic," said Diane Strohm, forester and natural resource planner at USAFA. "The forest here is spectacular; if we are not vigilant and proactive, we could lose it."

Efforts to curtail an epidemic included combing the Academy with intensive field surveys to locate infested trees, and promptly removing the trees to prevent further spread. The forestry staff there stepped up the forest thinning program as well, focusing on densely stocked forests that were at high risk for beetle attack due to heavy competition for water, nutrients and light.

Approximately 300 infested trees were removed in 2007 and only 12 in 2010. Ms. Strohm estimates that the Academy could have lost as many as 8,000 trees by this summer if these measures had not been taken.

"Years of fire suppression and a crushing, prolonged drought were a recipe for disaster," Ms. Strohm said. "Mountain pine beetles are an endemic part of the ecosystem and take out weakened trees. By enhancing tree vigor, forest thinning bolsters the residual trees' ability to repel bark beetle attack by pitching out the offending insects."

Air Force officials forecast widespread fiscal 2011 conservation program accomplishments, which underscore the Air Force's dedication to integrating environmental stewardship and military mission capabilities. ❑

Environmental Stewardship Across the Air Force

San Antonio military teams unite for month of Earth Day activities

AFCEE and AFRPA are spearheading a month-long initiative in San Antonio, garnering support of local installations for a united joint-military effort.

The Air Force Center for Engineering and the Environment and the Air Force Real Property Agency have teamed up with Joint Base San Antonio, Texas, and the Army Environmental Command in a month-long initiative focusing on environmental stewardship and conservation.

The events kicked off with an information fair for personnel in Building 171 at Lackland Air Force Base, Texas, where AFCEE and AFRPA are co-located. The fair provided a venue for dispersal of information and earth-friendly tips from tenant agencies, local businesses, and subject matter experts. The fair also provided a sign-up booth for other events on the agenda.

Some of the events planned between March 31 and April 21 include local highway, river and park clean ups, participation in a Port San Antonio Fiesta event, tree planting, participation in city beautification projects, planting of a vegetable garden at a local school, and hosting of informational seminars by local utility and "green" businesses. An official ceremony will conclude the initiative, with officials from Joint Base San Antonio in attendance.

Swap day gave residents a chance to dispose of their unwanted items and take home others free of charge.

Kadena reduces, reuses and recycles

By Maria Aresbanez
Kadena Air Base

Kadena Air Base celebrated Earth Day 2010 with Earth Week and a theme of "performing daily acts of green". To help celebrate, military family housing organized the first Hazardous Material Amnesty Day on the island, and put the three "R's" of Reduce, Reuse and Recycle, to work as their daily act of green.

Sponsored by the MFH maintenance group, and co-sponsored by Natural Resources Management and Outdoor Recreation, Hazardous Material Amnesty Day offered residents a venue to safely dispose of both hazardous and non-hazardous materials for free.

Home to over 22,000 active duty military members, civilians, and their dependents, residents produced almost 20 million pounds of refuse and 3.3 million pounds of recyclables in 2010 alone. This equates to over 56 percent of Kadena's overall refuse and almost 25 percent of their overall recyclables. In addition, the Heroes of Planet Earth program picked up more than 2.71 tons of debris from base jungle clean-ups and off base beach and underwater cleanups since its 2009 inception, making the need for Amnesty Day clear.

Amnesty Day was subdivided into two phases. Phase I called for the turn-in of hazardous materials for screening,

during which materials were classified either for disposal or for re-use. Materials for disposal were brought to the base's hazardous waste storage area for final disposition. Items that could be re-used were kept for Phase II, the swap meet to be held the next day. The swap meet made hazardous materials and household items available for pick-up and further use.

With the help of over 25 volunteers, over 3,500 pounds of recyclables and refuse were collected and all reusable items were given away.

Members of Pack 102 helped mix cement to stabilize the cedar posts which supported the new bat houses.

Boy Scout Pack 102 teams with Lackland AFB

On February 19, a group of Cub and Boy Scouts from Pack 102, along with their den chiefs, Cubmaster and families, joined forces with the Lackland Air Force Base Golf Course and US Lawns to improve the golf course in two ways: adding a splash of color and reducing the mosquito population. Active scout members, in addition to parents and siblings, spent the afternoon volunteering their time for the service project.

Pack 102, from Boerne, Texas, volunteers for multiple service projects throughout the year, and was excited by the opportunity to be a part of this ongoing project. As part of their scouting commitment, they seek avenues to get involved and assist the community. The boys experienced being a part of a growing conservation effort to beautify the golf course without increasing the water consumption, and learned about natural methods of pest control.

They began the afternoon by spreading 150 pounds of native Texas and Oklahoma wildflower seed around many of the holes. Using seeds native to the area will give the golf course colorful blooms without increasing the need for watering and maintenance. The seed mix contains bright flowers, such as Texas bluebonnets, daisies, poppies and Indian paintbrushes, as well as local grasses that will bloom throughout the spring and summer. After they wilt, these will re-seed to flower again in coming years, offering continued enjoyment.

After seeding the course, the scouts installed eight bat boxes near the creek area to help with mosquito control. The boys positioned cedar posts, secured them with concrete, then attached two pre-constructed houses to each of these. Each bat box will become home to about 50 bats, typically the Mexican Free-Tailed Bat in this area. Measuring about 3.5 inches and weighing just over a 0.5 ounces, these speedy bats will each up to a thousand mosquitoes every night. Giving these bats a place to nest helps reduce the insect population on the course without using pesticides and chemicals that can contaminate the land and harm other creatures. It also helps protect the bats, which are suffering from population decline due to loss of natural roosting sites.

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Mark Gifford of HGL, a sub-contractor to CH2MHill, uses a direct push drill rig to collect groundwater samples in a neighborhood near the Massachusetts Military Reservation. The rig allows for quicker and less costly sampling along with minimal disruption to the soil and vegetation. AFCEE purchased a direct push rig to save money and achieve greater flexibility with scheduling drilling activities. (Courtesy Photo)